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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
KHATRI, PRANAV V	

ART UNIT	PAPER NUMBER
2872	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/787,095	HAYASHI ET AL.	
	Examiner	Art Unit	
	Pranav V. Khatri	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *05 December 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9 and 23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/12/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4, 7, 8, 9 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hinton et al. (US Patent No. 5,450,119) in view of Nakajima (US Patent No. 6,052,211).

Regarding claim 1, Hinton et al. discloses an optical scanner comprising (see Hinton et al. Fig 3 and 4): a plurality of light sources (30A, 32A, 34A,and 36A) configured to emit beams including first and second beams (Col 4 lines 23-26, modulated beams 6, 8, 10 and 12); a coupling optical system (beams are coupled with cylindrical lenses 30B, 32B, 34B and 34B) configured to couple beams emitted from the light sources; a line image (the cylindrical lenses are also interpreted to be the line image system) focusing optical system configured to focus each beam coupled to a line image extending longer in a mainscan direction; a deflector (38 and 40) provided with deflecting reflective surfaces (mirror) on focused positions of the line image and a common rotary axis (42) for the deflecting reflective surfaces, and configured to be shared by the beams from the light sources, and to deflect the beams focused (deflector 38 shares beams from light sources 30A and 34A, and deflector 40 shares beams from

light source 32A and 36A); a scanning optical system provided with at least two scanning lenses (30C, 32C, 34C,and 36C each have two scanning lenses as seen figure 3 and 4) and configured to guide the beams deflected to a plurality of target surfaces for optical scanning; wherein the beams traveling toward the deflector (38 and 49) have an open angle Θ in a deflecting rotation plane (fig 3, beams from light source 34A and 30A have a first open angle, and beams from 32A and 36A have a second open angle, the angle between the light beams are an open angle), a scanning lens (30C, 32C, 34C,and 36C) proximate to one of the target surfaces (photoreceptor), among the at least two scanning lenses, passes only the beams (6, 8, 10, and 12) traveling toward the one of the target surfaces (as seen in figure 4 to the photoreceptor, beam 6 travels through scanning lenses 30C, beam 8 through lenses 32C, beam 10 through lenses 36C, and beam 12 through lenses 34C), and scanning lenses (30C, 32C, 34C,and 36C) proximate to the target surfaces, among the at least two scanning lenses, configured to guide the beams (6, 8, 10, and 12) to different target surfaces (photoreceptor with different surface areas for different colors 6, 8, 10, and 12, background Col 1 lines 38-55) have optical actions different from each other. Hinton et al. is silent in the teaching of a photodetector configured to receive the beams deflected at the deflector.

However, Nakajima discloses a photodetector (figure 3, numeral 32-34) configured to receive the beams deflected at the deflector (15).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the scanning device of Hinton et al. with a scanning

device that has a photodetector of Nakajima for the purpose of detecting the beams beginning and ending scanning cycle (see Nakajima Col 5 lines 25-27).

Regarding claim 4, Hinton et al. in view of Nakajima discloses wherein the scanning lens (30C, 32C, 34C,and 36C) proximate to one of the target surfaces (photoreceptor with different surface areas for different colors 6, 8, 10, and 12, background Col 1 lines 38-55) for guiding the beams to different target surfaces are arranged in different layouts (as seen in figures 3 and 4)

Regarding claim 7, Hinton et al. in view of Nakajima discloses wherein the beams emitted from at least two light sources (30A and 34A) corresponding to different target surfaces (the different surfaces associated with the different color beams 6 and 12) are spatially separated (30C and 34C, as seen in figure 3 and 4) from each other in the deflecting rotation plane (30A deflects off the left side of deflector 38, and 34A deflects of the right side of deflector 38) on optical paths extending from the light sources (30A and 34A) to the line image focusing optical system (30B, 32B, 34B and 34B).

Regarding claim 8, Hinton et al. in view of Nakajima discloses wherein at least two light sources (30A, 32A 34A and 36A) corresponding to different target surfaces (the different surfaces associated with the different color beams 6, 8, 10 and 12) are integrated (30A with 32A, and 34A and 36A, as seen in figure 3).

Regarding claim 9, Hinton et al. in view of Nakajima discloses wherein the photodetector (see Nakajima figure 3 numeral 32-34) configured to receive the beams deflected at the deflector (15) receives the beams corresponding to different target surfaces. It is interpreted that the Hinton et al. reference would incorporate four

photodetectors, and each would detect the beams beginning and ending scanning cycle.

Regarding claim 23, Hinton et al. in view of Nakajima discloses an image forming apparatus comprising (see Hinton et al. Fig 3, background Col 1 lines 35-45, and Col 2 lines 4-22, which discloses an image forming apparatus); an optical scanner comprising (see Hinton et al. Fig 3 and 4): a plurality of light sources (30A, 32A, 34A,and 36A) configured to emit beams including first and second beams (Col 4 lines 23-26, modulated beams 6, 8, 10 and 12); a coupling optical system (beams are coupled with cylindrical lenses 30B, 32B, 34B and 34B) configured to couple beams emitted from the light sources; a line image (the cylindrical lenses are also interpreted to be the line image system) focusing optical system configured to focus each beam coupled to a line image extending longer in a mainscan direction; a deflector (38 and 40) provided with deflecting reflective surfaces (mirror) on focused positions of the line image and a common rotary axis (42) for the deflecting reflective surfaces, and configured to be shared by the beams from the light sources, and to deflect the beams focused (deflector 38 shares beams from light sources 30A and 34A, and deflector 40 shares beams from light source 32A and 36A); a scanning optical system provided with at least two scanning lenses (30C, 32C, 34C,and 36C each have two scanning lenses as seen figure 3 and 4) and configured to guide the beams deflected to a plurality of photosensitive objects (see Hinton et al. background Col 1 lines 48-51, four photoreceptor drums) surfaces for optical scanning; and a photodetector (see Nakajima figure 3, numeral 32-34) configured to receive the beams deflected at the deflector (15),

wherein the beams traveling toward the deflector (38 and 49) have an open angle Θ in a deflecting rotation plane (fig 3, beams from light source 34A and 30A have a first open angle, and beams from 32A and 36A have a second open angle, the angle between the light beams are an open angle), a scanning lens (30C, 32C, 34C,and 36C) proximate to one of the photosensitive objects (one of the four photoreceptor drums), among the at least two scanning lenses, passes only the beams (6, 8, 10, and 12) traveling toward the one of the photosensitive objects (as seen in figure 4 to the photoreceptor drums, beam 6 travels through scanning lenses 30C, beam 8 through lenses 32C, beam 10 through lenses 36C, and beam 12 through lenses 34C), and scanning lenses (30C, 32C, 34C,and 36C) proximate to the target surfaces, among the at least two scanning lenses, configured to guide the beams (6, 8, 10, and 12) to different photosensitive objects (four photoreceptor drums with different surfaces for different colors 6, 8, 10, and 12, background Col 1 lines 38-55) have optical actions different from each other.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hinton et al. (US Patent No. 5,450,119) in view of Nakajima (US Patent No. 6,052,211) and in further view of Koide (US Patent No. 5,251,055).

Hinton et al. in view of Nakajima discloses the claimed invention as set forth above. Hinton et al. in view of Nakajima is silent about the teaching wherein the scanning lens proximate to one of the target surfaces has a power in a sub scan direction higher than a power in a sub scan direction of a scanning lens proximate to the deflector.

However, Koide teaches wherein the scanning lens proximate to one of the target surfaces has a power in a sub scan direction higher than a power in a sub scan direction of a scanning lens proximate to the deflector (see fig 2b, sub scanning direction view, lens 30b or 30a has a curvature in the subscanning direction, the other lenses do not have a curvature, therefore, the lens near the target surfaces ha a power greater in the subscanning direction than lens 29).

It would have been an obvious to one having ordinary skill in the art at the time the invention was made to modify the scanning lens of Hinton et al. in view of Nakajima with a scanning lens near the target surface which has more power than the one near the deflector of Koide for the purpose of focusing an image in the subscanning direction.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hinton et al. (US Patent No. 5,450,119) in view of Nakajima (US Patent No. 6,052,211) and in further view of Ngoi et al. (US Patent No. 6,307,799).

Regarding claim 3, Hinton et al. in view of Nakajima discloses wherein the scanning optical system (see Hinton et al. Fig 3 and 4) arranged between the deflector (30D, 32D, 34D, and 36D) and the plurality of target surfaces (photoreceptor) for guiding the beams to different target surfaces (Fig 4). Hinton et al. in view of Nakajima is silent about the teaching wherein it includes a reducing optical system.

However, Ngoi et al. teaches wherein it includes a reducing optical system (Col 2 Lines 26-33).

It would have been an obvious to one having ordinary skill in the art at the time the invention was made to modify the scanning lens of Hinton et al. in view of Nakajima

with a scanning lens that has a reducing optical system of Ngoi et al. for the purpose of reducing the spot size of a laser beam on the optical media.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hinton et al. (US Patent No. 5,450,119) in view of Nakajima (US Patent No. 6,052,211) and in further view of Kato (US Patent Application Publication 2002/005/7331 A1).

Hinton et al. in view of Nakajima discloses the claimed invention as set forth above except is silent in the teaching wherein the scanning lens proximate to one of the target surfaces has a radius of sub scan curvature on at least one surface asymmetrically varying gradually from an optical axis toward both peripheries.

However, Kato discloses wherein the scanning lens (see Kato Fig 1 Numeral 62) proximate to one of the target surfaces (8) has a radius of sub scan curvature on at least one surface asymmetrically varying gradually from an optical axis toward both peripheries (see Kato Fig 1 Numeral 62 and Page 4 Paragraph 0059 Lines 1-2).

It would have been an obvious to one having ordinary skill in the art at the time the invention was made to modify the scanning lens of Hinton et al. in view of Nakajima with a lens radius surface asymmetrically varying such as Kato for the purpose of further focusing an image.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hinton et al. (US Patent No. 5,450,119) in view of Nakajima (US Patent No. 6,052,211) and in further view of Kato (US Patent Application Publication 2002/005/7331 A1) and in further view of Hsu et al. (US Patent No. 6,339,490).

Hinton et al. in view of Nakajima in further view of Kato discloses wherein the scanning lenses (Hinton et al. 30C, 32C, 34C,and 36C) proximate to the target surfaces for guiding the beams to different target surfaces have a same shape (see Hinton et al. fig 4, scanning lenses have the same shape) as each other. Hinton et al. in view of Nakajima are silent about wherein it is rotated about an optical axis by 180 degrees oppositely from each other and arranged in different layouts.

However, Hsu et al. discloses wherein a scanning lens is rotated about an optical axis by 180 degrees oppositely from each other and arranged in different layouts (see Hsu et al. Col 2 lines 36-41).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the scanning apparatus of Hinton et al. in view of Nakajima in further view of Kato with a lens that rotates of Hsu et al. (as seen in Fig 2A-2C) for the purpose of higher tolerance, less optical parts, easy assembly and low production costs (see Hsu et al. abstract).

Response to Arguments

Applicant's arguments with respect to claims 1-9 and 23 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pranav V. Khatri whose telephone number is 571-272-8311. The examiner can normally be reached on M-F, 8:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pranav Khatri
Examiner
01/31/2006

EUNCHA P. CHERRY
PRIMARY EXAMINER